Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Magnetic Field Effects Generated by Inter-molecular Excited States in Organic Semiconductors LIANG YAN, MING SHAO, BIN HU, University of Tennessee — It has experimentally found that an external magnetic field can change electroluminescence, electric current, and photocurrent, generating magnetic field effects (MFEs) in non-magnetic organic semiconductors. Our photoluminescence studies have found that the intermolecular excited states are accountable for the MFEs while the intra-molecular excited states exhibit negligible MFEs. Our experimental studies further indicated that inter-molecular excited states can exhibit tunable spin-orbital coupling and exchange interaction based on materials mixing. We observed that tuning inter-molecular spin-orbital coupling and exchange interaction can largely modify the MFEs through spin-dependent formation and intersystem crossing in inter-molecular excited states. Therefore, the use of inter-molecular excited states presents a new mechanism to generate magnetic responses in non-magnetic organic semiconductors.

Bin Hu
University of Tennessee

Date submitted: 26 Nov 2010 Electronic form version 1.4